ARCADIS

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Date: February 15, 2021
Subject:
Remedial Design Work Plan
Lower Ley Creek Subsite of the Onondaga Lake Superfund Site
Syracuse, New York

Dear Ms. Sacks,

On behalf of the Respondents to the Administrative Order on Consent for Remedial Design (Respondents), Arcadis of New York, Inc. is submitting this Remedial Design Work Plan associated with the Lower Ley Creek Subsite of the Onondaga Lake Superfund Site pursuant to the United States Environmental Protection Agency (USEPA) Record of Decision dated September 2016.

Please let us know if you have any questions or comments.

Sincerely,
Arcadis of New York, Inc.

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Project Coordinator

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Enclosure

ARCADIS

Respondents to Administrative Order on Consent for Remedial Design

REMEDIAL DESIGN WORK PLAN

Lower Ley Creek Subsite Operable Unit 25 of the Onondaga Lake Superfund Site City of Syracuse/Town of Salina Onondaga County, New York

Superfund Site ID: NYD986913580
CERCLA 02-2016-2014

February 2021

REMEDIAL DESIGN WORK PLAN

Lower Ley Creek Subsite Operable Unit 25 of the Onondaga Lake Superfund Site City of Syracuse/Town of Salina Onondaga County, New York

February 2021

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CERCLA 02-2016-2014

Our Ref:

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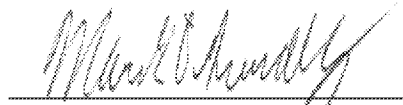

2/15/2021
Mark O. Gravelding, P.E. Date
Project Coordinator

2/15/2021
Lauren Putnam Date
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TABLES

FIGURES (provided separately)

APPENDICES (provided separately)

ACRONYMS AND ABBREVIATIONS

AOC	Administrative Order on Consent
APE	Area of Potential Effect
Arcadis	Arcadis of New York, Inc.
BMP	Baseline Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
COC	constituent of concern
CRA	Cultural Resource Assessment
Final RD	Final (100%) Remedial Design Report
FIS	Flood Insurance Study
FS	Feasibility Study
HEC-RAS	Hydrologic Engineering Centers River Analysis System
ICIAP	Institutional Controls Implementation and Assurance Plan
Intermediate RD	Intermediate (60%) Remedial Design Report
LDF	local disposal facility
mg/kg	milligram per kilogram
NHPA	National Historic Preservation Act of 1966
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSOPRHP	New York State Office of Parks, Recreation and Historic Preservation
OLCC	Old Ley Creek Channel
OU	Operable Unit
PCB	polychlorinated biphenyl
PDI	Pre-Design Investigation
PDI Report	Pre-Design Investigation Data Summary Report Revised (Arcadis 2020)
PDI WP	Pre-Design Investigation Work Plan
Pre-Final RD	Pre-Final (95%) Remedial Design Report
Preliminary RD	Preliminary (30%) Remedial Design Report

PRSP	Periodic Review Support Plan
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDWP	Remediation Design Work Plan
Respondents	Respondents to the Administrative Order on Consent for Remedial Design
RI	Remediation Investigation
ROD	Record of Decision
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOW	Statement of Work
Subsite	Lower Ley Creek Subsite
TCLP	toxicity characteristic leaching procedure
TDP	Transportation and Disposal Plan
TSCA	Toxic Substances Control Act
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	volatile organic compound

1 INTRODUCTION

This Remedial Design Work Plan (RDWP) presents the design process and approach that will guide development of the remedial design (RD) for the Lower Ley Creek Subsite (Subsite) of the Onondaga Lake Superfund Site. The Subsite (Superfund Site Identification Number: NYD986913580) is located in Onondaga County, New York within the City of Syracuse, and the Town of Salina (Figure 1-1). Arcadis of New York, Inc. (Arcadis) prepared this RDWP on behalf of the Respondents to the Administrative Order on Consent (AOC) for Remedial Design (Respondents), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 02-2016-2014, pursuant to the United States Environmental Protection Agency (USEPA) Record of Decision (ROD; USEPA 2014).

1.1 Site Background and History

A summary of the history of the Subsite was provided in Section 2.2 of the Pre-Design Investigation (PDI) Work Plan (PDI WP; Arcadis 2016). This section provides a description of the Subsite and a summary of investigations previously performed at the Subsite.

1.1.1 Subsite Description

The Subsite is designated as Operable Unit (OU) 25 of the Onondaga Lake Superfund Site, which was listed on the National Priorities List on December 16, 1994. The Subsite is located within an urbanized area of eastern Syracuse, New York (Figure 1-2) and consists of the lower 2 miles of Ley Creek between the State Route 11 Bridge and Onondaga Lake. The Subsite also includes a 3.7-acre wetland situated on the southern bank of the creek adjacent to the closed Cooper Crouse-Hinds North Landfill; and the Old Ley Creek Channel (OLCC), which was an original section of the Creek before Ley Creek was widened and reconfigured during a flood control project in the 1970s. In addition, the Subsite includes several sections along the banks of the creek where dredged sediments were placed during the flood control project.

The Subsite is located within an area zoned as an Industrial District. It is bordered by parking lots, the closed Town of Salina Landfill (previously remediated), and the closed Cooper Crouse-Hinds North and South Landfills (previously remediated), other historically landfilled areas, manufacturing operations, several undeveloped properties, and a railroad line. The footprints of the former landfills are illustrated on Figure 1-2 and shown in context on Figures 1-3a through 1-3j. An underground natural gas pipeline owned by National Grid and an underground oil pipeline owned by Buckeye Pipeline Company run parallel to the northern bank of the creek for much of the section bordered by the former City of Syracuse Landfill Area and the Crouse Hinds Landfills (Figure 1-2).

Ley Creek passes under bridges along State Route 11, 7th North Street, and Interstate 81. Bear Trap Creek enters Ley Creek upstream of 7th North Street. The Ley Creek channel is well defined, and the banks of Ley Creek are near vertical in many areas. The bottom of the stream is dominated by soft sediment with some areas of stone or other hard surfaces. Much of the stream is shallow, but water may be as deep as 14 feet in certain sections during high water events, particularly downstream of the 7th North Street Bridge. In general, Ley Creek is narrower and shallower upstream of the 7th North Street Bridge, and wider and deeper downstream of the 7th North Street Bridge. The immediate banks of the

stream are bordered predominantly by herbaceous vegetation. Some woody shrubs are also mixed with herbaceous vegetation, and sections of the bank are wooded. Beyond the narrow strip of vegetation, Ley Creek is surrounded by industrial operations, parking lots, remediated and historical landfills, and railroad tracks; the creek transverses the northern Syracuse metro area, a heavily urbanized environment.

Two drainage swales of interest are within or adjacent to the Subsite: a former "swale area" in the upstream portion of the Subsite near the OLCC and the former City of Syracuse Landfill Area; and the "Western Drainage Swale," which is a small north/south drainage ditch located north of Ley Creek and due west of the closed Town of Salina Landfill (see Figure 1-2). The former "swale area" located near the OLCC was investigated in 2010 to a depth of 5 feet, and results indicate polychlorinated biphenyl (PCB) concentrations as high as 500 milligram per kilogram (mg/kg) in this area (USEPA 2014). In 2010 excavation was performed by the Town of Salina within the Western Drainage Swale as part of remediation activities associated with the closed Town of Salina Landfill (CHA 2013).

1.1.2 Previous Investigations

Investigative fieldwork for the Remedial Investigation/Feasibility Study (RI/FS) at the Subsite began in November 2009 at the direction of the New York State Department of Environmental Conservation (NYSDEC). Sediment, soil, groundwater, and surface water samples were collected and analyzed. In addition, fish samples were collected as part of the human health and ecological risk assessments.

USEPA conducted field investigations at the Subsite from 2009 through 2011, which culminated in the completion of RI and FS reports in 2013 and 2014, respectively. As documented in the PDI WP, which was conditionally approved by USEPA in a letter dated February 2, 2017, the following data for the Subsite have been adopted for use moving forward:

- Soil and sediment data collected by USEPA in 2009, 2010, and 2011.
- Soil and sediment data collected by NYSDEC in 2010.

Results of the RI sampling activities are presented in the Final RI Report (Los Alamos Technical Associates, Inc. 2013) and the ROD, and additional information on previous sampling activities can be found in the Final FS Report (HydroGeologic, Inc. 2014).

Since issuance of the ROD, PDI activities were conducted from 2017 to 2019 to refine the vertical and horizontal extent of PCB impacts in areas in and around the ROD-defined removal areas. Primarily, PDI soil and sediment samples were analyzed for PCBs, with select samples also submitted for analysis of metals. A detailed summary of the PDI soil and sediment sampling program and results are presented in the revised PDI Data Summary Report (PDI Report; Arcadis 2020).

1.2 Description of the Selected Remedy

The selected remedy for the Subsite, as presented in the 2014 USEPA ROD, includes the following components:

- Excavate PCB-contaminated soils located along the upland areas adjacent to Ley Creek to meet the soil clean up objectives (SCOs).
- Excavate PCB-contaminated sediment from Ley Creek exceeding the sediment criteria.

- Excavate PCB-contaminated sediment from the adjacent wetland areas to meet the sediment criteria.
- Cover with at least one foot of soil any contaminated soils that cannot be safely excavated due to existing oil and natural gas pipelines that run parallel to Ley Creek.
- Cap sediments under the Route 11 Bridge currently proposed for excavation, if necessary, to protect the structural integrity of the bridge.
- Cap other soils or sediments currently proposed for excavation that cannot be safely or effectively excavated (e.g., cap sediments due to the existing gas pipeline that crosses Ley Creek).
- Transport excavated contaminated soils and sediments containing PCB concentrations greater than 50 mg/kg to a Toxic Substances Control Act (TSCA)-compliant facility.
- Transport excavated soils and sediments that fail toxicity characteristic leaching procedure (TCLP) testing, are determined to be characteristic of hazardous waste, and are non-TSCA waste (i.e., PCB concentrations less than 50 mg/kg) to an off-site Resource Conservation and Recovery Act (RCRA)-compliant facility.
- Transport excavated soils and sediments that are not TSCA-regulated (i.e., PCB concentrations less than 50 mg/kg) and are not determined to be characteristic of hazardous waste to a local disposal facility (LDF), if available/feasible[1].
- Backfill the excavated wetland areas with soil that meets the unrestricted SCOs.
- Restore excavated soil areas with clean substrate and vegetation consistent with an approved habitat restoration plan to be developed as part of the RD.
- Place at least one foot of substrate similar to the existing sediments over disturbed sediment areas and restore vegetation.
- Implement (i.e., property records in the County Clerk's Office of Onondaga County) institutional controls in the form of an environmental easement/restrictive covenant that will, at a minimum, restrict the use of the properties within the Subsite to commercial uses and restrict intrusive activities in areas where residual contamination remains unless the activities are in accordance with a USEPA-approved Site Management Plan (SMP).
- Develop an SMP that will provide for the proper management of all post-construction remedy components.[2]

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[1] LDF options currently under consideration include consolidation under the cap of the closed Town of Salina Landfill within the area controlled by the leachate collection system or in a newly constructed cell with a liner and leachate collection system on the recently capped Cooper Crouse-Hinds North Landfill (which was properly closed under the State Superfund program). The specific local disposal location will be determined during the RD. Should local disposal options be determined not to be viable, these materials will be sent to an appropriate non-local facility for disposal.

[2] The SMP will describe procedures to confirm that the requisite engineering (e.g., subsurface demarcation layer) and institutional controls (e.g., environmental easement/restrictive covenant) are in place and that nothing has occurred that will impair the ability of said controls to protect public health or the environment. The SMP will also include: a soil management plan; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of the above-noted environmental easement and/or restrictive covenant; a provision for the

Additionally, per the ROD, during the RD, a Phase IA Cultural Resource Assessment (CRA) will be performed to document the Subsite's historic resources, if any.

PDI activities performed between 2017 and 2019 resulted in refinements to the removal limits described in the ROD based on a comparison of historical and PDI data to the PCB cleanup goals and/or the SCOs for metals as defined in the ROD. The removal limits presented in the USEPA-approved PDI Report (Arcadis 2020) are illustrated on Figures 1-3a through 1-3j.

The PCB cleanup goal for sediment remediation includes removal or capping of material with PCB concentrations that exceed 1 mg/kg, which was established based on NYSDEC Technical Guidance for Screening and Assessment of Contaminated Sediments (NYSDEC 2014). PCBs are collocated with the majority of other sediment constituents of concern (COCs), including metals. As presented in the ROD, addressing PCB concentrations that exceed 1 mg/kg is expected to address risks associated with other sediment COCs (primarily metals) (USEPA 2014).

The PCB cleanup goals for soil remediation include removal or capping of material with PCB concentrations exceeding 1 mg/kg in the upper 2 feet and/or 10 mg/kg below 2 feet. Additionally, as presented in the ROD, USEPA adopted NYSDEC SCOs as the metals cleanup standards for soil remediation at the Subsite. The Subsite-specific SCOs are shown in Table 1-1 below.

Table 1-1. Soil Cleanup Objectives

Chemicals of Concern	Surface Soil – top 2 feet (mg/kg)	Subsurface Soil – deeper than 2 feet (mg/kg)
Arsenic	13	16
Cadmium	4	9.3
Trivalent Chromium	41	1,500
Copper	50	270
Lead	63	1,000
Mercury	0.18	2.8
Nickel	30	310
Silver	2	1,500
Zinc	109	10,000

Because PCBs are collocated with the majority of other COCs, addressing PCB concentrations that exceed the cleanup goal for soils will address risks associated with other soil COCs (primarily metals). However, in development of the removal limits for the selected remedy, if there are situations where

performance of the operation, maintenance, and monitoring required by the remedy and a provision that the property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

PCBs are below the established PCB cleanup goal but historical metals results are slightly above the SCOs, then a determination of whether the soil removal limit is included in the RD will be reviewed on a case-by-case basis in consultation with USEPA.

1.3 Remedial Action Objectives

The ROD established the following Subsite-specific remedial action objectives to protect human health and the environment:

- Reduce or eliminate any direct contact and ingestion threat associated with contaminated soils and sediments.
- Minimize exposure of ecological receptors to contaminated soils and sediments.
- Reduce the cancer risks and non-cancer health hazards associated with eating fish from Ley Creek by reducing the concentration of contaminants in fish.

1.4 Remedial Design Work Plan Objective

The primary object of this RDWP is to describe the process for development of detailed engineering designs to address soil and sediment contamination at the Subsite, consistent with the 2014 ROD, AOC, and subsequent revisions to the remedy scope discussed in Section 1.2. As required by the Remedial Design Statement of Work for the Onondaga Lake Superfund Site, OU 25 – Lower Ley Creek (SOW; USEPA 2016), this RDWP includes the following plans for implementing RD activities:

- Description of the overall management strategy for performing the RD, including a proposal for phasing of design and construction, if applicable (see Sections 6 and 7);
- Description of how the RD for Lower Ley Creek will be sequenced with the Upper Ley Creek project (see Section 7);
- Description of the proposed general approach to contracting, construction, and operation and maintenance of the remedial action as necessary to implement the work as specified by the ROD (see Sections 5 and 7);
- Description of the responsibility and authority of all organizations and key personnel involved with the development of the RD (see Section 3.1);
- Descriptions of aspects of the remedy implementation requirements requiring refinement based on PDI data, or requiring clarification based on administrative (e.g., access restrictions) or physical (e.g., infrastructure offsets) requirements (see Sections 4 and 5, respectively);
- If local disposal is determined to be viable, then a description of the steps necessary for consolidating, solidifying, if necessary, and dewatering of waste material at a local disposal location and process water treatment requirements (see Section 5.4);
- Description of the hydrologic study performed (see Section 2.1.5);
- Descriptions of any applicable permitting requirements and other regulatory requirements for the RA and local disposal, if chosen (see Section 4.4);

- Description of plans for establishing setbacks from pipelines, overhead transmission lines, other underground utilities and bridge abutments (see Section 5.2.1);
- Description of plans for addressing geotechnical stability in the design approach for areas identified for deep excavation (see Section 5.2);
- Description of plans for obtaining access in connection with the work as specified by the ROD, such as property acquisition, property leases, and/or easements (see Section 4.3);
- Baseline Monitoring Plan (BMP; see Appendix A);
- Proposed RD schedule (see Section 7); and
- Description of information to be reviewed to determine whether additional sampling or resurveying of Lower Ley Creek sediments is warranted in order to complete the final design following completion of Upper Ley Creek remediation activities (see Section 4.1).

This RDWP has been developed to support the preparation of the RD. Existing site information and data (Section 2) as well as data obtained from additional RD support activities (Section 4) will be used, as appropriate, to inform the RD activities described in Section 5. The RD will be performed in a series of phased deliverables, as described in Section 6.

2 REVIEW AND ANALYSIS OF EXISTING DATA

This section describes current site conditions, data obtained during previous site investigation activities, the scope of previous investigations, and known data gaps.

2.1 Physical, Geotechnical, and Hydraulic Conditions

Physical, geotechnical, and hydraulic conditions based on previous investigation activities at the Subsite are summarized in the sections below.

2.1.1 Geology and Hydrogeology

Bedrock geology in the area of Ley Creek generally consists of sedimentary rock units from the Paleozoic-age Salina Group which, in order of oldest to youngest, consists of the Vernon Formation, the Syracuse Formation, Camillus Shale, and the Bertie Formation. Specifically, the bedrock underlying the Ley Creek channel is made up of units of the Vernon Formation, which consists of upper Silurian shale and dolostone.

Groundwater discharge to surface water channels accounts for most of the stream flow in the Onondaga Lake Basin. Groundwater discharge accounts for an estimated 56 percent of stream flow in Ley Creek. The groundwater can be found from 8 to 12 feet below ground surface in the overburden of the Subsite.

Efforts since 1970 to alleviate the flooding of Ley Creek have been generally successful, though the creek still periodically floods beyond its banks.

Groundwater contamination is not being addressed as part of this action, and instead is being addressed as part of the Town of Salina Landfill subsite.

2.1.2 Geotechnical Conditions

To support the RD, in-water and upland geotechnical borings were installed during the 2017 PDI program in areas of anticipated excavation/dredging. The geotechnical borings were specifically placed in areas where deeper removal is proposed and adjacent to existing infrastructure to support the RD process for stability analysis of critical areas and structures. Geotechnical parameter laboratory testing was performed during the PDI program to provide a basis of design for the soils and sediments to be further evaluated in the RD. The locations of the upland and in-water borings and a summary of the geotechnical laboratory testing results can be found in Appendix D of the PDI Report (Arcadis 2020).

The summary of the soil sieve size analytical results show that geotechnical conditions vary throughout the Subsite. In general, Subsite soils consist of coarse to fine sand with fines (e.g., silts and clay). Atterberg Limit analysis results show that soil fines primarily consist of clay. Bedrock was not encountered during geotechnical boring field activities. These results will be evaluated as part of the RD process to design, as appropriate, excavation and/or bank stability shoring for areas of deeper excavation and dredging.

2.1.3 Infrastructure, Topography, and Bathymetry

Topographic survey was performed during the PDI in April 2017 and included aerial photography and conventional survey techniques in the field to augment the aerial survey data. Utilities in the vicinity of the Subsite were also located during the topographic survey. Available records were reviewed and coordination with DigSafe was performed to document existing physical characteristics of the existing infrastructure and utilities in the area of the Subsite prior to PDI sampling activities.

Bathymetric survey was performed at the Subsite in May 2017 during the PDI and was used in conjunction with the topographic survey data to document the current surface sediment conditions and support development of bathymetric (i.e., top of sediment) elevations, as well as support in the development of a hydraulic model of the current channel conditions (Section 2.1.5). The survey data indicate the bed of Ley Creek within the Subsite is well channeled with steep sides and the creek depth ranges from 1 to 14 feet deep, averaging 3 to 5 feet over much of its length. The deepest sections are closer to the lake and the shallowest sections are near the Route 11 Bridge. The bottom of the stream is primarily composed of soft sediment, with few areas of stone or riffle (rocky shoal).

The results of the topography, bathymetry, infrastructure, and utility investigations/surveys at the Subsite are presented on Figures 2-1a through 2-1j. The survey data will be used during the RD process to develop several design components, including whether removal areas of the selected remedy require refinement-based (i.e., reduction) offsets from infrastructure and/or utilities.

2.1.4 Sediment Thickness and Stratigraphy

Sediment probing was performed concurrently with PDI topographic surveys in April 2017. Sediments were probed at 10- to 15-foot intervals along each of the 32 transects the length of the Subsite. Of the 158 sediment thickness locations probed, recorded measurements ranged from 0 feet (suggesting the presence of surface debris) to a maximum of 8.6 feet. The average sediment thickness based on the recorded values was approximately 3.4 feet, with more than 130 of the records suggesting more than 1 foot of accumulated soft sediment. Sediment probing data will be used during the RD to develop removal and design.

2.1.5 Hydrodynamic Modeling

Ley Creek is classified as a 6 New York Codes, Rules and Regulations (NYCRR) § 701.7 New York State Class C stream from the mouth of the Creek to a point approximately 1.3 miles upstream of the mouth. Upstream of this point, Ley Creek is a Class B stream.

The nearest United States Geological Survey (USGS) stream gauge station, USGS 04240120 Ley Creek, is located near Park Street in Syracuse, New York, approximately 0.3 miles upstream of the confluence of Onondaga Lake and Ley Creek and downstream from proposed removal areas. Stream flow characteristics shown in Table 2-1 below were obtained from the USGS database for the Ley Creek gauge station:

Table 2-1. Ley Creek Stream Flow Characteristics

Period of Record or Date	Flow Characteristics	Discharge (cfs)
1973-2020	Maximum average daily flow	1,110[a]
1973-2020	Minimum average daily flow	1.9[b]
7/1/15	Maximum peak stream flow	1,610
1973-2020	Annual mean discharge	44

Notes:
[a] Value based on data from 7/1/2015.
[b] Value based on data from 2/6/1977.
cfs = cubic feet per second

As presented in Appendix G of the PDI Report (Arcadis 2020), a preliminary hydraulic model of existing hydraulic conditions during the 100-year flood flows was developed based on topographic and bathymetric transect data, as well as detailed creek crossing data (e.g., bridges, pipelines) collected during the PDI activities. The survey and creek crossing data were used to develop topographic cross sections that were used in Hydrologic Engineering Centers River Analysis System (HEC-RAS) modeling software to compute parameters such as water surface elevation, flow area, depth, velocity, and other characteristics to assess creek flow conditions. Drainage areas, flowrates, and channel roughness coefficients were based on the Federal Emergency Management Agency Flood Insurance Study (FIS) for Onondaga County, New York (all Jurisdictions) effective November 4, 2016. Two flow rates were utilized in modeling the 100-year flood based on the flow change specified in the FIS, which is located at the confluence of Bear Trap Creek and Ley Creek (approximately 1.1 miles upstream of Onondaga Lake). A flowrate of 2,330 cfs was utilized upstream of the confluence of Bear Trap Creek and Ley Creek. A flowrate of 2,850 cfs was utilized from the confluence of Bear Trap Creak and Ley Creek to Onondaga Lake. Both of these flowrates are consistent with the assumptions from the FIS. This newly generated existing conditions model will be used to assess the impacts of the remedy as the details of the remedy are determined during the RD, including a no-rise evaluation. Additionally, as needed, the hydraulic analysis will be performed during the RD to determine the effect of the remedy on stream flow, flooding and dynamics, and to identify the appropriate materials and bathymetry for restoration and long-term sustainability of Ley Creek.

2.1.6 Wetland Delineation and Habitat Characterization

PDI activities performed in 2018 included qualitative aquatic habitat and semi-quantitative bank characterizations within targeted remediation areas to support both creek channel and bank restoration design. The habitat characterization activities included wildlife observations and aquatic habitat characterization, bank characterization, and wetland delineation and upland characterization.

As presented in Appendix E of the PDI Report (Arcadis 2020), the wildlife observations and aquatic habitat characterization activities identified several species of fish, herptiles, mollusks, mammals, and birds within the Subsite. In addition, the aquatic habitat characterization qualitatively assessed the presence and absence of Stream Visual Assessment Protocol Variables (United States Department of Agriculture 1998) for fish habitat and general habitat type characteristics (e.g., water depth, inorganic

substrate composition, submerged aquatic vegetation, large woody debris, embeddedness). A summary of the main aquatic habitat types observed within the targeted remedial area is presented in Appendix E of the PDI Report, Table 1 (Arcadis 2020).

Bank characterization was performed during the PDI to assess bank areas that may be disturbed by remedial activities to help develop the appropriate restoration techniques as part of the restoration design. Representative bank habitats were characterized based on slope, vegetation, aquatic habitat components and stability. For each bank area to be disturbed, a bank erosion hazard index was calculated in accordance with the standard methodology (Rosgen 1996). The resulting bank erosion hazard index estimates for the Subsite ranged from low to high with an average condition of moderate for Ley Creek, indicating that the current banks have varying degrees of bank instability. Bank characterization results are summarized in the PDI Report (Arcadis 2020; refer to Appendix E, Table 2, and Appendix D, Figures D1-D3).

As described in the ROD, two wetland areas were delineated at the Subsite, one immediately west of Ley Creek, and one 800 feet southwest of Ley Creek, as shown on Figures 1-3h through 1-3j. PDI activities included supplemental wetland delineation and upland characterization in ten areas where soil remediation is planned at the Subsite. The boundaries of identified wetlands along the stream corridor and within the remediation area were delineated and the vegetation of each wetland was characterized to assist with the resource impact quantification, permit equivalency package, and restoration design. The results of the wetland delineation and upland characterization indicate that a total of 25.1 acres of wetland area are present within the 10 soil remediation areas, consisting primarily of Shallow Emergent Marsh and some isolated areas of Forested Floodplain. Fringe Shallow Emergent Marsh wetlands dominated by common reed were located along much of the length of the Subsite stream corridor. Terrestrial habitat in the soil remediation areas consisted of a mix of actively used land and degraded Southern Successional Forest and Shrubland, dominated by invasive species. A detailed summary of the wetland delineation and upland characterization is provided in Appendix F of the PDI Report (Arcadis 2020). The results of the wetland delineation and habitat characterization activities will be used during the RD process to inform the habitat restoration design.

2.1.7 Potential Subsurface Obstructions

Initial field reconnaissance performed during PDI activities noted some areas of debris in Ley Creek and multiple areas of rubble and/or rubbish in upland areas. In addition, sediment probing results of 0 foot suggest the presence of surface debris present in the creek bottom at several locations. The PDI WP (Arcadis 2016) included the potential for collection of side-scan sonar and sub-bottom profiling survey data during PDI survey activities, however, insufficient water depths and field conditions during survey activities made the deployment of the necessary equipment infeasible, and these surveys were not completed. Additional PDI activities related to potential subsurface obstructions are not anticipated to support the RD process; instead, the available information on potential subsurface obstructions will be used during the RD process to inform the sediment removal design.

2.2 Summary of Subsite Impacts

The sampling results presented in the ROD indicate that PCBs are collocated with the vast majority of the other COCs within the Subsite. Additional PCB data was collected during PDI activities and compared to the ROD-defined removal areas to further refine the removal extents.

Review of these data show that PCB impacts throughout the Subsite are widespread and variable. PCB results obtained during the PDI activities show that PCB concentrations in soil range from non-detect to 580 mg/kg, with a mean and median PCB concentration of 12 mg/kg and 0.75 mg/kg, respectively. PCB concentrations in sediment range from non-detect to 350 mg/kg, with a mean and median PCB concentration of 18 mg/kg and 2.8 mg/kg, respectively. As presented on Figures 1-3a through 1-3j, remedial area boundaries indicate the depth of impacts are greater in upstream soils and sediments. The depth of impacts throughout the Subsite ranges from 0.5 to 14 feet below ground surface.

As presented in the USEPA-approved PDI Report (Arcadis 2020), historical PCB sample results in area SOIL-A indicate this area should be considered for a proposed removal extent reduction area based on the following conclusions:

- PCBs are not present above the cleanup goal (see PDI Report, Appendix I);
- The historical metals results are generally below the screening criteria, with the exception of arsenic, copper, lead, mercury, and zinc, which are not substantially above the screening criteria (see PDI Report, Appendix I);
- The area is adjacent to and within the City of Syracuse landfill area (see purple shading on Figures 1-3i and 1-3j for the landfill area), and although the remedy addresses PCBs found in dredge spoils/flood residue that had been deposited on top of landfilled waste, the remedy does not address PCBs (or other constituents) contained in landfilled waste;
- Boring logs from LLCD01 and LLCD02 confirm the presence of anthropogenic material such as asphalt, concrete, and brick generally indicative of landfill waste/construction demolition debris which should not be considered as part of the Lower Ley Creek Subsite (see PDI Report, Appendix I); and
- The location of SOIL-A is relatively isolated and separated from the remainder of the removal areas, and the negative impacts from additional disturbance required to remediate outweighs the benefit of removing the soil.

The ROD-defined removal extent for SOIL-A is illustrated on Figures 1-3i and 1-3j as a black hatch pattern to represent a proposed removal extent reduction area. Removal in this area will not be considered further in the RD process if USEPA agrees by approving this RDWP.

2.3 Material Handling Data

This section describes sampling activities and results obtained during the PDI related to waste characterization and treatability studies. The information obtained will be used to determine and support selection of disposal facilities and inform the material handling design.

2.3.1 Waste Characterization

PDI activities included waste characterization in conjunction with the soil and sediment sample collection activities described above. Composite samples were collected from 12 upland soil locations and nine sediment locations. The composite waste characterization samples were submitted for laboratory analysis for typical TCLP parameters. Of the soil and sediment waste characterization samples analyzed, all TCLP concentrations detected were well below the applicable TCLP hazardous waste standards.

In addition to the TCLP results, PCB concentrations observed during soil and sediment sampling for delineation of the removal area extent will be used during the RD phase to determine appropriate waste characterization requirements. PCB results suggest that there will be some TSCA-regulated waste to be transported off-site for disposal. However, the TCLP results discussed above, as well as similar results discussed in Section 2.3.2 associated with the performance of treatability studies, indicate the vast majority of materials targeted for excavation will be classified as non-hazardous. These wastes will be managed in an existing LDF (i.e., the closed Town of Salina Landfill or closed Cooper Crouse-Hinds North Landfill) or will be sent to an appropriate non-local facility for disposal.

2.3.2 Treatability Study

The remedy set forth in the ROD included an evaluation of LDF disposal of select excavated materials. Excavated materials will very likely require processing, treatment, and/or conditioning to allow for hauling to and placement in the LDF. Additionally, decant water associated with the processing of saturated materials (e.g., supernatant, spoils-impacted stormwater) may require treatment to improve suspended material settling conditions before water treatment and discharge. A treatability study performed during the PDI assessed the solidification and stabilization of removed sediments in preparation for disposal and the settling/separation of materials suspended in decant water. A complete description of the performance of the treatability study activities and associated results is included in Appendix H of the PDI Report (Arcadis 2020).

Results of the treatability study suggest that passive dewatering, particularly in light of the ability to mix excavated sediments with similarly excavated upland soils, is sufficiently able to provide for primary dewatering and preparation for material stabilization. Even without the benefit of adding drier upland soils, Portland cement additive ratios were identified on a removal area-specific basis with resultant materials able to pass paint filter testing and meet proposed materials strength goals for placement in the LDF. Additionally, the settling of materials observed in jar tests and the results of pre- and post-stabilization waste characterization analyses suggest there is likely no need for enhanced dewatering or materials separation techniques (e.g., flocculant addition) before water treatment.

2.4 Additional Data Needs

The RD will be developed based on the review and analysis of the existing site data presented above. Next steps for data collection in accordance with the ROD and remedial action objectives include:

- Perform an additional pre-removal investigation to further delineate the remedial boundary.
- Perform the Phase IA CRA.

These additional investigations are described in Section 4.

3 REMEDIAL DESIGN PROJECT MANAGEMENT

This section describes how RD efforts will be managed, including project team organization and prescribed mechanisms of communication. USEPA is the lead agency of the Lower Ley Creek project. The Respondents and USEPA will jointly participate in the implementation of the RD process.

3.1 Team Organization, Responsibilities, and Authorities

Development of the RD will be a collaborative effort between USEPA, the Respondents, the Design Engineer, and other supporting parties, as needed. The key entities involved with the development of the RD and their respective responsibility and authority are as follows:

- USEPA is the lead governmental agency for the Subsite and may seek input from the New York State Department of Environmental Conservation and Onondaga Nation.
- The Respondents have the responsibility for the preparation of a remedial design for the selected remedy. The Respondents have overall responsibility for the submission of all plans and submittals outlined in this RDWP.
- The Respondents have retained Arcadis as the Design Engineer to support the design efforts. All agency communications will be through the Design Engineer, unless otherwise directed by the Respondents or USEPA.

3.2 Communications

The Respondents will continue to submit monthly progress reports to USEPA in accordance with the AOC and SOW. In addition, periodic meetings between USEPA, the Respondents, and the Design Engineer will be scheduled as needed to discuss the status of the ongoing RD efforts, upcoming events, deliverables, and to resolve any issues that may arise. The schedule for these meetings will be determined in consultation with USEPA.

4 REMEDIAL DESIGN SUPPORT ACTIVITIES

Remedial design support activities include additional investigations to be performed prior to initiation of construction as well as administrative steps to be completed prior to mobilization for the remedial action.

4.1 Additional Pre-Removal Assessment

To address USEPA's concerns regarding historical sample results outside the ROD-defined removal limits (i.e., L-7 and SS-19/SB-19), an assessment will be performed to compare the relative location of historical samples with the site boundary of the Town of Salina Landfill remedial action to determine whether the location of the historical samples was previously addressed as part of the Town's remedial action. Based on the results of the assessment (i.e., if the historical samples are outside the site boundary of the Town of Salina Landfill remedial action), additional evaluations and/or sampling may be performed.

Note that, based on the progress of the ongoing remediation of Upper Ley Creek, and especially if there are overtopping conditions or releases to the Subsite over the duration of Upper Ley Creek construction, additional pre-removal surficial sediment sampling may be necessary at the Subsite to confirm surface sediment conditions prior to implementation of the remedial action. Whether the need for additional sampling (or resurvey) of the Subsite sediments is warranted will be assessed following completion of the Upper Ley Creek remedial activities and based on review of releases, if any, noted during implementation of the Upper Ley Creek remedial activities.

4.2 Phase IA Cultural Resource Assessment

In accordance with the ROD and SOW, a CRA will be conducted for the Subsite to determine whether potentially significant historic properties are present in the vicinity of the targeted remediation areas and whether potential short-term or long-term impacts may occur to those resources by implementation of the remedial activities. This section describes the Phase IA CRA work plan for areas that are anticipated to become directly or indirectly impacted by remedial activities. The schedule for the Phase IA CRA will be determined after USEPA and the New York State Historic Preservation Office approve the work plan. A Phase IB CRA will be conducted only if determined to be necessary based on the Phase IA results and concurrence by relevant regulatory agencies.

If cultural resources are identified at the Subsite, then consultation with appropriate regulatory agencies will be conducted prior to finalizing the RD. Necessary modifications to the remedy will be incorporated into the design based on the results of the CRA and agency requirements.

4.2.1 Areas Previously Disturbed

As described in Section 1.1, much of the Subsite has been disturbed previously, indicating that most if not all the area is not archaeologically sensitive. Specifically, much of the Subsite has been disturbed due to the following activities:

- Prior dredging of Ley Creek in the 1970s, as documented in the 2014 ROD, to widen, deepen, and reroute the creek

- Prior placement of dredge spoils on the bank of Ley Creek in the 1970s, as documented in the 2014 ROD
- Prior construction of the Town of Salina Landfill area in the 1950s and remediation of the area in the 2010s
- Prior construction of the Cooper Crouse-Hinds Landfill area in the 1960s and remediation of the North portion of the landfill in the 2010s
- Prior construction of the former City of Syracuse Landfill areas.

Historical drawings illustrating the prior dredging of Ley Creek and dredge spoils areas are provided in Appendix B.

Additionally, much of the targeted remediation areas are grass covered with indications of below-ground utilities present. These areas of known prior disturbance and the location of known below-ground utilities near proposed areas of disturbance are illustrated on Figures 4-1a through 4-1h.

Construction activities planned as part of the Subsite remediation include excavation / dredging and backfill / grading (Figures 2-1a through 2-1j). While the environmental setting of the Subsite formerly may have been attractive for Native American utilization, twentieth century development of the area effectively disturbed the area to the extent that resources formerly present in the footprint of the disturbances noted above likely would have been disturbed or destroyed. Sub-fill soils or layers beneath disturbed soil horizons are not considered to be archaeologically sensitive.

It is assumed, at a minimum, the locations of known prior disturbance are not archaeologically sensitive due to the extent of prior disturbance, and it is concluded that planned construction activities in these areas will not impact any cultural resources within the footprint of prior disturbance, and as such these areas are not included in the project's Area of Potential Effect (APE; discussed below) and additional cultural resource investigations are not warranted in these known prior disturbance areas. Work proposed by this RDWP for the Subsite, and areas of known prior disturbance outside of the APE, are shown on Figures 2-1a through 2-1j.

4.2.2 Cultural Resource Assessment

This section describes the methodologies to be employed in conducting the CRA within the remaining remediation areas with limited or no known disturbance compared to the areas described in Section 4.2.1. These remaining potentially undisturbed areas constitute the project's APE. Evaluation of impacts will include the extent of surface disturbance and depth of ground disturbance. One-quarter mile surrounding the identified APE will be evaluated for potential impacts of the project on significant and potentially significant historic structures. The APE areas are shown on Figures 4-1a through 4-1h.

This section outlines the technical efforts necessary to determine the potential presence of significant or potentially significant historic properties (archaeological and architectural resources) in the APE and make recommendations regarding further investigations and evaluations. The Phase IA effort will consist of the following tasks:

- Documentation research, soil data analysis, and pedestrian reconnaissance survey;

- Identification and preliminary assessment of impacts to Historic period structures within one-quarter mile of the APE; and
- Preparation of a Phase IA CRA Report.

All CRA work described herein will be conducted in accordance with the requirements of Section 106 of the National Historic Preservation Act of 1966 (NHPA) and its implementing regulations (i.e., 36 Code of Federal Regulations [CFR] Part 800), CERCLA Compliance with Other Laws Manual: Part II (USEPA, August 1989), Executive Order 11593, and the guidelines and standards currently adopted by New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) (New York Archaeological Council 1994, 2000; NYSOPRHP 2005). All professional/supervisory level personnel must meet the qualifications set forth in 36 CFR 61. Meeting NHPA requirements will also require coordination by the lead regulatory agency (i.e., USEPA) with NYSOPRHP and Onondaga Tribal representatives. Results of those consultations will be included in the cultural resource survey as appropriate.

4.2.2.1 Documentary Research, Soil Data Analysis, and Pedestrian Reconnaissance Survey

Documentary research of the APE and its vicinity, at a minimum, will be conducted in person or virtually at the NYSOPRHP, New York State Museum, Onondaga Tribal Office, Onondaga Historical Association, Onondaga County Soil and Water Conservation District Office, Syracuse Public Library, other appropriate repositories, and internet-based resources. Experts and other knowledgeable individuals also will be interviewed, if possible.

Relevant soil data from the APE and/or comparable surrounding locales will be examined and analyzed as part of the CRA. The objectives of the archaeological analyses of the relevant available soil data are to determine:

- The approximate depth of alluvium and/or fill within the APE
- The extent of ground disturbance within the APE
- Whether former ground surfaces or other cultural deposits that may contain evidence of Pre-Contact period and/or Historic period activity are present below fill layers or within alluvial deposits.

As part of this task, virtual consultations with staff of the Onondaga County Soil and Water Conservation District Office as well as Web-based research through the NRCS Web Soil survey will occur to aid in addressing these objectives.

Based on that research, relevant environmental and cultural contexts for the project vicinity will be developed and assessments of the archaeological sensitivity of the APE will be formulated. Assessment of Native American period site sensitivity will be based on the locations of known archaeological sites and traditional cultural properties reported in the literature and repository databases, or identified by a knowledgeable interviewee, as well as consideration of the current and former topographic and physiographic characteristics of the APE. Discussions with appropriate Tribal representatives and/or groups will be undertaken through the relevant regulatory agencies as part of the sensitivity assessments.

Particular attention will be paid to the potential for the presence of Native American archaeological sites deeply buried within alluvium. Research on the developmental history and assessment of the Historic

period sensitivity of the APE will be based on analyses of eighteenth through twentieth century maps as well as a review of other primary and secondary sources. An appropriate level of research on any industrial/manufacturing-related remains identified also will be undertaken.

NYSOPRHP archaeological site recording forms will be completed for any archaeological site or isolated artifacts identified as part of the cultural resource investigation that are not already included in that agency's database. Any forms completed will be provided to NYSOPRHP and included in the Phase IA CRA report as a separate exhibit.

A pedestrian reconnaissance of the APE and its vicinity will be undertaken to aid in determining the archaeological sensitivity of the area. The objectives of the reconnaissance are to gather information that will aid in analyzing the documentary data and terrain characteristics to determine that sensitivity. Observations within the APE will be made of the existing terrain to identify areas of high, well-drained ground and available freshwater sources. During the site reconnaissance, observations will be made for visible indications of prior ground disturbance and land filling, recorded and unrecorded structural remains and other cultural features, artifact concentrations, lithic resources, vegetation characteristics, and the locations of identified and potential archaeological resources as revealed by the documentary research. Such information will aid in the determination of the archaeological sensitivity of the APE.

Determinations will be made of the extent to which past construction activities and other events within the APE would have affected the preservation of any cultural resources potentially present within the APE. Prior ground disturbance will be evaluated in terms of its spatial extent and depth below modern grade. Prior ground disturbance will be determined using data from the following sources:

- Previously conducted soil borings
- United States National Resource Service Soil Survey maps and Onondaga County Soil and Water Conservation District consultation
- Historic period maps
- Available documentation for local industries
- Informant interviews
- Pedestrian reconnaissance
- Other as yet unidentified sources.

Analysis and determinations of past ground disturbance within the APE will be discussed in the Phase IA CRA report.

Also, as part of the task, determinations will be made as to the extent that remedial efforts will impact the APE. It will be clearly stated in the Phase IA CRA report if remediation efforts may cause adverse impacts to historic properties within the APE. If no such impacts are expected, additional cultural resource investigations of the APE may not be necessary.

4.2.2.2 Identification and Preliminary Assessment of Impacts to Historic Period Properties within One-Quarter Mile of the Area of Potential Effect

This task will include an inventory of significant or potentially significant historic structures and/or traditional cultural properties within one-quarter mile of the APE. At a minimum, virtual research for the work will be conducted at the NYSOPRHP, Onondaga Historical Association, and other appropriate on-line repositories. Experts and other knowledgeable people also will be interviewed. Based on that inventory, a determination will be made as to potential short-term and long-term visual impacts that may occur on potentially significant historic structures, scenic/heritage vistas, and traditional cultural properties due to remedial implementation. Short-term visual impacts consist of temporary construction-related effects on cultural resources such as vibrations, dust, vegetation removal, vehicle movement, construction material storage impediments, or increased access. Long-term visual impacts include permanent adverse line of sight effects, addition of structures or modification to the landscape and vegetation resulting in permanent or long-term changes to the historic context of an area, or changes in use and access to a historic area. Available United States National Park Service technical guidelines or other standards, currently used by NYOPRHP (Martin 2014), will be used for the impact evaluations.

4.2.2.3 Cultural Resource Assessment Reporting

As part of the reporting on the activities described herein, a draft Phase IA CRA report will be prepared based on the information developed by the tasks outlined above. The Phase IA CRA report will specifically include the following:

- Details of the methodologies employed to conduct the Phase IA CRA study
- Results of the study, including a management summary, associated figures, and photographs to illustrate the results, as appropriate
- Conclusions on the potential presence or absence of significant archaeological and architectural resources within the APE and on potential impacts to them because of remedy implementation
- Conclusions as to any visual impacts that may occur to historic properties because of remedy implementation
- Recommendations for any warranted additional investigations or evaluations
- A complete reference citation section.

If no additional investigations or evaluations of all or portions the APE are warranted, such conclusions will be clearly stated in the report. If a Phase IB investigation is determined to be necessary based on the Phase IA CRA results and comments from the appropriate regulatory agencies, a separate work plan will be prepared to outline the Phase IB efforts.

4.3 Access Requirements

Obtaining access to non-Respondent properties within the Subsite will be required prior to construction of the remedy. Based on previous access agreements obtained during PDI activities, it is anticipated that similar results related to property access grants, in the form of written agreements, will be successfully

obtained during finalization of the design. Similar efforts made during the PDI activities will be used to obtain access to non-Respondent properties within the Subsite prior to construction, including:

- Best efforts will be made pursuant to Section XI of the AOC to obtain written consent for access from the owners of all parcels needed to perform the remedial action (including all Respondent property owners). Properties that will likely require written consent for access from the owners are presented on Figure 4-2.
- A letter and access agreement form will be mailed to each of the non-Respondent owners, and follow-up attempts will be made, as needed, to contact (via telephone) any property owners that do not respond to the initial mailing. Prior to mailing letters, the owner names and addresses will be confirmed for the parcels illustrated on Figure 4-2 (and any others for which access is determined necessary during the RD).

With one exception, during the PDI all Respondent and non-Respondent parcel owners agreed to provide access to their properties for the performance of field activities. Despite best efforts, Solvents and Petroleum Services (the owner of Parcels 073.-01-05.0 and 073.-01-06.0, which includes a portion of the proposed removal areas SOIL-I2, SOIL-I3, SED-K, SED-K1, SED-KL, SED-KL1, and SED-L) refused to provide access for sample collection, although they agreed to provide access for equipment and personnel, provided no sample materials were collected from their property.

4.4 Permit Equivalency Package

Consultation and coordination with regulatory agencies to obtain applicable permit equivalencies prior to construction activities will be performed during the RD, in accordance with the ROD and SOW. The remedy will be conducted under the USEPA CERCLA program. As such, state and federal regulatory requirements are not strictly applied as permits/approvals but typically as permit equivalents as defined by the CERCLA statute. Federal, state, and local requirements will be evaluated in the RD using the Applicable or Relevant and Appropriate Requirements, To-Be-Considered Guidance, and Other Guidelines tables provided in the 2014 ROD (USEPA 2014), a copy of which is included in Appendix C.

5 REMEDIAL DESIGN COMPONENTS

This section outlines the engineering design process that will be used to perform the RD. The RD will include the following design components and processes:

- Site Preparation. Facilities will be designed for the handling and processing of the removed sediment and soils, treatment of separated water prior to discharge, and handling of clean import materials for backfill and capping (as appropriate).
- Soil and Sediment Removal. Engineering plans and specifications will be developed to remove contaminated soils and sediment and transport these materials for processing.
    - Offset Evaluation. Utility assessment and structural evaluations will be performed for utilities within removal areas and infrastructure within and/or adjacent to removal areas to determine whether removal can be performed safely and effectively. If it is determined that removal cannot occur within these areas, then the proposed removal area(s) will be refined based on the required offsets from utilities and/or infrastructure.
    - Post-Removal Sampling. A program will be developed to sample certain soil and sediment removal areas post-removal to confirm achievement of the cleanup goals.
- Handling, Dewatering and Stabilization of Impact Material. Engineering plans and specifications will be developed for material (soil/sediment and water) handling and stabilization prior to transport and disposal (either to the LDF and/or a non-local facility).
- Final Transport and Disposal of Impacted Material. Engineering plans and specifications will be developed for final transportation and disposal processes and logistics. A Transportation and Disposal Plan (TDP) will be developed during the RD process as a supporting deliverable to the design.
- Backfill and Restoration. Engineering plans and specifications will be developed for backfilling soil and sediment removal areas and restoration of the Subsite, including a habitat restoration design plan.
- Capping. Engineering plans and specifications will be developed for capping within the vicinity of sensitive structures (e.g., bridges and utilities) where excavation cannot be performed safely or effectively. Cap design will be developed based on results of the offset evaluation.
- During-Construction Monitoring and Environmental Controls. Engineering plans and specifications will be developed for methods and implementation of best management practices and engineering controls to minimize temporary impacts to the environment or community during construction.

Many of these RD elements are interdependent on other related design elements. This section describes the design process for each component presented above and identifies key factors that influence other design components and ultimately the final design. To improve overall design efficiencies, some of the components listed above may be combined during the design process.

The design report submittals associated with the RD are discussed in Section 6. Sections 5.1 through 5.7 outlines each of the RD components and the design process, considering the four stages of design specified in Section 6. Additional design support activities will be performed, as appropriate, as discussed

in Section 4. Supporting plans such as the Habitat Restoration Plan, TDP, SMP, Institutional Controls Implementation and Assurance Plan (ICIAP), and Periodic Review Support Plan (PRSP) will be prepared to support the RD, as specified in Section 6.

5.1 Site Preparation

The design of the access and support areas will be determined during preparation of the RD. The design and location of the temporary staging area/facility(s) will consider removal operations and material transport throughout the Subsite as well as the space available and ease of access. The staging area/facility(s) will be designed based on the removal volumes and anticipated rates of removal, and an evaluation of the removal operations and sequencing will be performed to determine the appropriate locations for the staging area/facility(s). The results of the PDI survey (Section 2.1.3) will be considered in selecting the final location(s) of the potential access points and support areas, as will the ability to negotiate access to properties not owned by the Respondents. The site preparation design will also provide information related to utility relocation/protection/replacement, as necessary based on the selected location for access. Site preparation will be designed to limit vegetation clearing, to the extent practicable. Cleared vegetation will either be disposed of locally, stockpiled for habitat reconstruction, or mulched and used onsite.

Following determination of the locations of potential staging areas/facility(s), the design will be refined to include details related to staging area materials and layout. These details will be presented in design drawings depicting the layout of the staging area/facility(s) and support requirements. The design will include structural details and necessary utilities required to support material handling operations (e.g., piping, electrical requirements). The final design will include material requirements and performance specifications for the temporary staging area/facility(s) design elements.

5.2 Soil and Sediment Removal

Removal of soil and sediment is proposed throughout the Subsite, as shown on Figures 2-1a through 2-1j, to depths ranging from 0.5 to 14 feet based on the refined removal limits presented in the PDI Report (Arcadis 2020).[3] Estimated excavation volumes include:

- Excavation of an estimated 94,400 cubic yards of impacted soils located on the northern and southern banks of Ley Creek
- Excavation of an estimated 71,500 cubic yards of impacted sediment from Ley Creek.

It is anticipated that mechanical removal methods (e.g., excavators, articulating dump trucks/track trucks) will be employed for soil and sediment removal areas of the Subsite, and that sediment removal will be performed in the wet. However, the appropriate methods to remove soil and sediment and/or the required performance requirements will be determined during preparation of the RD. The selected removal method will influence the approach to resuspension control, impacted material handling, dewatering, water treatment, and other components of the RD described in subsequent subsections of Section 5.

[3] As noted in Section 1.2, in certain areas soil or sediment may be capped instead of removed based on proximity to infrastructure and/or utilities.

The design will include additional refinement to the removal extents to account for constructability and based on potential additional pre-removal sampling as described in Section 4.1. The actual volume to be removed will account for operational considerations, such as allowances for offsets from critical areas and structures and/or sloping or excavation support that may be necessary to stabilize deeper removals and/or deep transitions between removal areas.

Major design components include a remedial excavation plan for the upland soil and a dredging plan for sediment in the Creek, which will incorporate the geotechnical stability analysis and design for excavation support. The design will present the removal grades in the form of elevation contours and dredge prisms. The existing topographic and bathymetric contours will be used to evaluate slope stability during removal and will incorporate allowable over-excavation/over-dredge depths. In addition, the offset evaluation (Section 5.2.1) will be used to refine the removal boundaries adjacent to critical areas (e.g., bridges, roads, railroad, and utilities). These areas will be further evaluated during the RD to verify the minimum offset required during removal activities. In addition to potential modifications to the removal extent based on the offset evaluation, the removal areas and volumes will be refined throughout the design process based on constructability review and supporting design studies (e.g., CRA, pre-removal sampling).

As described in Section 2.1.7, potential subsurface obstructions may require modifications to removal means and methods to address the presence of subsurface debris. In addition, a post-removal sampling plan will be developed as part of the RD for specific removal areas (Section 5.2.2). As such, the RD will also outline the process for the data review and decision-making processes to guide field decisions during construction activities.

5.2.1 Offset Evaluation

An offset evaluation of existing known utilities, critical areas, and structures identified at the Subsite during PDI activities will be performed during the RD to determine whether removal of impacted material can be performed safely and effectively within the vicinity of these critical areas.

An initial assessment of known utilities within removal areas considered information gathered during the PDI and additional DigSafe requests to confirm requirements related to removal around known utilities. Known utilities are illustrated on Figures 2-1a through 2-1j. The specific utilities identified within removal areas are summarized in Table 5-1 below. Minimum offsets required by the owners for each of these known utilities will be evaluated during the RD.

Table 5-1. Known Subsite Utilities

Type of Utility	Figure Reference	Removal Area(s) Potentially Affected by Offset
National Grid gas line	2-1a, 2-1d, 2-1e, 2-1f, 2-1g, 2-1h, 2-1i, 2-1j	SOIL-L (2-foot) SOIL-I (2-foot) SOIL-D (2-foot) SOIL C (2-foot) SOIL-B (2-foot) SED-A (1-foot)
National Grid gas line	2-1a	SOIL-L (2-foot) SED-L (5-foot) SED-J9 (5-foot) SED J-11 (7-foot)
Water line	2-1a, 2-1e	SOIL-L (2-foot) SOIL-J9 (5-foot) SOIL-J10 (6-foot) SOIL-J11 (7-foot) SED-I (2-foot) SOIL-C (2-foot)
Sanitary sewer pipe	2-1a	SOIL-J10 (6-foot) SOIL-J9 (5-foot) SOIL-L (2-foot) SOIL-L8 (4-foot)
Storm drainpipe	2-1d	SOIL-D (2-foot)
Buckeye high pressure petroleum line	2-1e, 2-1f, 2-1g, 2-1h, 2-1i, 2-1j	SOIL-E (2-foot) SED-EF (2-foot) SOIL-C (2-foot) SOIL B (2-foot) SED-A (1-foot)
Underground utilities (electric, communication, CATV, telephone, fiber)	2-1e, 2-1a	SED-EF (2-foot) SOIL-L8 (4-foot) SOIL L-9 (3-foot) SOIL-L (2-foot)

Initial communications with utility owners indicate that complete removal of impacted material adjacent to Subsite utilities is unlikely and will generally require a minimum 15-foot offset. As a result, the design will evaluate the extent of these restricted areas and potential modifications to the remedy that can be implemented to eliminate exposure risks if complete removal of impacted material in these areas cannot be performed.

Known critical areas and structures within the Subsite (e.g., bridges, roads, buildings, parking lots) are illustrated on Figures 2-1a through 2-1j. The specific critical areas and structures identified within or adjacent to removal areas are summarized in Table 5-2 below. Minimum offsets required by the owners for each of these known critical areas and structures will be evaluated during the RD.

Table 5-2. Known Subsite Critical Areas and Structures

Feature	Figure Reference	Removal Area(s) Potentially Affected by Offset
Route 11 Bridge Abutments	2-1a	SED-J9 (5-foot) SED-J11 (7-foot) SOIL-L (2-foot)
Route 11	2-1a	SOIL-L (2-foot)
Existing Building	2-1f	SOIL-D (2-foot)
7th North St Bridge Abutments	2-1f	SED-EF (2-foot)
Existing Parking Lot	2-1g	SOIL-C (2-foot)
CSX-owned Railroad	2-1h 2-1i 2-1j	SOIL-R1 (2-foot) SOIL-R2 (2-foot) SOIL-R3 (2-foot) SOIL-R4 (2-foot)

Initial review indicates that complete removal of impacted material adjacent to the features listed in Table 5-2 is unlikely. A detailed structural assessment of the features presented in Table 5-2 will be performed during the RD based on geotechnical data collected during the PDI (Section 2.1.2) and infrastructure as-built conditions to be confirmed with the owners. The design will use the assessment to evaluate the extent of restricted areas and potential modifications to the remedy that can be implemented to eliminate exposure risks if complete removal of impacted material in these areas cannot be performed.

If it is determined that removal to the depth currently proposed cannot occur adjacent to known utilities, critical areas, and structures, even with sloping and/or excavation support, then a combination of capping and removal or capping only (instead of removal) will likely be used to address the impacted soil or sediment.

5.2.2 Post-Removal Sampling

Post-removal sampling will be performed in select areas where the removal limits are not defined by samples that do not exceed the cleanup goals, either directly based on proximity or indirectly based topography and nearby samples that do not exceed the cleanup goals located at a similar elevation. An initial evaluation of PDI data indicate a post-removal sampling program will be defined in the RD for the following removal areas:

- SED-J7, SED-L1, SED-G4, and SED-F8 – The RD will define a post-removal sampling program to confirm the proposed vertical removal extent achieves PCB cleanup goals s.
- SOIL-J1 – The RD will define a post-removal sampling program to confirm proposed vertical removal extent achieves PCB cleanup goals in the vicinity of historical sample locations SS/SB-17, L-108, and SS/SB-18.
- SOIL-I2 – The RD will define a post-removal sampling program to confirm the proposed horizontal removal extent along the southern edge of SOIL-I2 achieves PCB cleanup goals.

- SOIL-I3 – The RD will define a post-removal sampling program to confirm the proposed vertical removal extent achieves cleanup goals and the proposed horizontal removal extent south of SOIL-I-018 achieves PCB cleanup goals.
- SOIL-H – The RD will define a post-removal sampling program to confirm the proposed horizontal removal extent along the southern and southeastern edge of SOIL-H achieves PCB cleanup goals.
- SOIL-H1 – The RD will define a post-removal sampling program to confirm the proposed horizontal removal extent southwest of SOIL-H-019 achieves PCB cleanup goals.
- SOIL-D – The RD will define a post-removal sampling program to confirm the proposed horizontal removal extent on the southwest boundary near Bear Trap Creek achieves PCB cleanup goals.
- SOIL-R1 through SOIL-R4 – The RD will define a post-removal sampling program to confirm the proposed horizontal removal extent defined between polygons achieves PCB cleanup goals.

During the design, the proposed areas listed above will be evaluated to determine the need for and frequency of post-removal sampling.

5.3 Handling, Dewatering, and Stabilization of Impacted Material

Excavated soil and dredged sediment will be transported to a temporary staging area/facility(s) and then dewatered and the impacted material stabilized prior to final transportation and disposal at the selected LDF and/or non-local facility. In addition, the water collected during the dewatering process will require treatment at a temporary water treatment system prior to discharge to the local sewer or to Ley Creek, as appropriate based on permit requirements.

The material handling, dewatering, and stabilization RD process will include evaluation and design (as appropriate) of the following operations:

- Material segregation facilities (e.g., debris, TSCA, and non-TSCA material)
- Material handling and dewatering/stabilization facilities.

The treatability study, as described in Section 2.3.2, will be used to inform the material stabilization design.

5.4 Final Transport and Disposal of Impacted Material

Material removal and handling design components will be used to inform the evaluation of final transportation and disposal processes and logistics. Following material handling and processing, certain waste material types will require transportation and disposal as indicated below:

- Materials containing PCB concentrations greater than 50 mg/kg will be transported to an off-site TSCA-compliant facility.
- Materials that are not TSCA-regulated (i.e., PCB concentrations less than 50 mg/kg) and are not characteristic hazardous waste will be transported to an LDF, if available and feasible.

As discussed in Section 2.3.1, no waste characterization samples failed TCLP testing, and as such no material is determined to be characteristic of hazardous waste for transport to an off-site RCRA-compliant facility.

As presented in the ROD, if water that is drained from the impacted material is discharged to surface waters, then it will be treated to meet NYSDEC discharge requirements; such requirements will be developed in consultation with USEPA to meet the substantive requirements of the state Water Quality Certification under Section 401 of the Federal Water Pollution Control Act (USEPA 2020).

In accordance with the AOC, a Local Disposal Assessment was performed to determine the potential feasibility of two local landfills for the final disposal of materials that are neither TSCA- or RCRA-regulated (Arcadis 2016). The assessment concluded that both local landfill sites are feasible options for the disposal of non-regulated material, and USEPA concurrence on the Local Disposal Assessment is anticipated concurrent with approval of this RDWP. Upon USEPA concurrence, the Respondents will initiate communication with the owner(s) and/or operator(s) of the chosen disposal facility(ies) to work towards an executed agreement which will state that the to-be excavated waste will be accepted in accordance with applicable requirements. Although the Respondents will initiate communication with the owner(s) and/or operator(s) upon USEPA concurrence on the Local Disposal Assessment, it is anticipated more than 90 days will be required to secure the executed Local Disposal Agreement(s); see Section 7 for additional details.

The design will include steps necessary for consolidating, solidifying, if necessary, and dewatering of the waste material at the local disposal location and associated water treatment requirements. In addition, a TDP will be developed during the design for transport and disposal of material to the selected facility(s), as described in the SOW. During the design process, proposed routes for shipment of waste material and communities affected by the shipment of the waste material will be evaluated. The evaluation will develop plans to minimize impacts on affected communities and will identify facilities that can receive TSCA and non-regulated waste material. Appropriate transporting procedures and performance standards will also be included.

5.5 Backfill and Restoration

Following removal activities, removal areas will be backfilled with clean fill material. Final backfill design will include material specifications and estimated backfill final grade or depth for soil and sediment areas as described in the remainder of this section.

5.5.1 Soil Backfill

In accordance with the ROD, soil removal areas will be backfilled with fill meeting the criteria set forth in the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, Appendix 5 (NYSDEC 2010). Ecologically sensitive wetland areas identified during the PDI will be backfilled with soil that meets unrestricted SCOs presented in Appendix 5 (NYSDEC 2010). Subsurface soil backfill material will be selected based on typical general fill materials provided in the New York State Department of Transportation Standard Specifications (2008). In addition, material selection, particularly for the surface soils, will be based on the habitat types identified during PDI wetland and habitat characterization activities, described in Section 2.1.6.

Except for removal areas SOIL-G (for which the proposed removal depth is less than 2 feet), as specified in the ROD, the backfill thickness will be at least 2 feet. As presented in the ROD, excavation of the southern bank soils (i.e., SOIL-E, -H, -I, -I2, and -I3 as defined in the ROD) may not be backfilled to grade, thus increasing the flood storage capacity of this floodplain. Final backfill elevations in this portion of the Subsite and other areas will be determined during the design based on flooding potential and desired habitat conditions. The hydrodynamic model (Section 2.1.6) will be used during the design to determine appropriate design elevations based on the existing bathymetry and topography and stream characteristics at the Subsite (e.g., stream velocities, flow, geometry).

Additionally, in removal areas where there is underlying municipal refuse, a readily-visible and permeable subsurface demarcation layer delineating the interface between the refuse/native soil and the clean soil cover will be installed.

5.5.2 Sediment Backfill

In accordance with the ROD, sediment removal areas will be backfilled with fill meeting the criteria of NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, Appendix 5 (NYSDEC 2010). As with soil backfill, the hydrodynamic model (Section 2.1.6) will be used during the design to determine appropriate design elevations based on the existing bathymetry and topography and stream characteristics at the Subsite (e.g., stream velocities, flow, geometry). In addition, the hydrodynamic model may be used to evaluate appropriate material type based on flow conditions. Backfill materials will also be selected based on geotechnical data and aquatic habitat compatibility.

As specified in the ROD, restoration of Ley Creek will include placement of at least one foot of substrate similar to the existing sediments. The specific thickness and substrate material to be used for backfill will be determined during the RD as part of the Habitat Restoration Plan. The hydrodynamic model will be used to verify that the sediment backfill design will not alter existing stream flow characteristics such that there will not be an increased probability of flooding and erosion during normal flow conditions as well as high flow events.

5.5.3 Habitat Restoration Plan

In accordance with the SOW, a Habitat Restoration Plan will be developed as a supporting deliverable to the RD. The ecological assessment, habitat characterization, and wetland delineation discussed in Section 2.1.6 will be used to develop the habitat restoration design for remediation areas. The Habitat Restoration Plan will:

- Describe the delineated wetlands and habitat types located in remediation areas.
- Identify the types and extent of backfill materials to be placed in each delineated area.
- Identify the types and locations of any seeding and plantings to be place in each delineated area.
- Establish design expectations for habitat construction in soil excavation areas and excavated wetland areas: the restoration will meet the substantive requirements of 6 NYCRR Part 608 and 663.
- Identify requirements for monitoring the restored habitat after completion of the remedial construction to assess restoration success and restoration maintenance.

- Consider actions needed, if any, for the protection of affected species.

Following identification of habitat types impacted by the remedy, the design will present the habitat restoration plan in the design drawings and will include material specifications.

5.6 Capping

Based on the results of the offset evaluation (Section 5.2.1), engineered capping may be required in areas where soil or sediment cannot be removed safely and effectively due to the presence of utilities and structures. In general, engineered caps consist of a variety of materials either placed in distinct layers or mixed together prior to placement. The types of materials that can be incorporated into a cap design include reactive materials and/or various types of aggregates. The cap design will evaluate cap performance based on cap material properties, PCB concentrations present in impacted soil or sediment, hydrodynamic conditions, erosive forces (e.g., ice and wave impacts), aquatic habitat compatibility, and existing floodplain and creek bed conditions.

The design will also include constructability reviews related to material availability, placement techniques, and operational considerations. The initial capping evaluation will be used to develop potential cap configurations that will be protective of human health and the environment by providing physical isolation and stabilization of soil or sediment in non-removal areas.

At a minimum, as specified in the ROD, the following areas will be considered for capping as part of the RD:

- Contaminated soil located on the northern bank of the Creek that cannot be safely excavated because of the presence of buried natural gas and oil pipelines will be covered with a least 1 foot of soil. Prior to placing the soil cover, a readily-visible and permeable subsurface demarcation layer delineating the interface between the contaminated soils and clean soil cover will be installed.
- A combination of dredging and capping of sediments under the Route 11 Bridge will be considered in the design to protect the bridge and not reduce the effective cross section of flow for flood protection.

Additional areas may also be considered for capping based on the results of slope stability and structural assessments and/or based on the offset evaluation performed during the RD. If capping is deemed necessary in areas where removal cannot be performed, then the design will present final cap configurations and capping elevations in the design drawings and will include material specifications, estimated cap material volumes, placement requirements, and performance standards. Final site conditions will be evaluated to confirm that no net fill is placed at the Subsite. If a net fill condition is found, then additional removal or a reduction in backfill may be proposed to offset the excess fill quantity.

5.7 Construction Monitoring and Environmental Controls

Monitoring will be required during construction activities to identify and address, if necessary, temporary impacts that may arise during construction activities. Anticipated construction monitoring includes:

- Water quality monitoring
- Air monitoring

- Structural survey and geotechnical monitoring.

Methods and implementation of best management practices and engineering controls will be evaluated during the design to minimize temporary impacts to the environment or community during construction activities. Corrective action levels to be utilized during construction activities will be proposed in the RD.

A BMP has been developed and appended to this RDWP as Appendix A to provide details on how baseline environmental conditions will be documented prior to construction. Plans will be developed during the RD to describe monitoring to be performed during construction. The SMP developed during the RD will describe monitoring to be performed after completion of the remedial action.

5.7.1 Water Quality Monitoring

The design will consider the following to determine the approach to water quality monitoring and resuspension control during removal activities and backfill/capping operations:

- Water quality requirements and measurement locations
- Bathymetry
- Stream velocities and flow
- Streambed geometry
- Streambed and shoreline characteristics for anchoring
- Storm or high-flow event impacts
- Dredging and material placement methods
- Access considerations.

Baseline monitoring will be performed prior to construction in accordance with the BMP (Appendix A) to evaluate naturally occurring background turbidity concentrations within the stream. In addition, baseline monitoring activities will include collection of water column samples to obtain representative water quality measurements of ambient PCB levels during conditions preceding intrusive in-water work.

Resuspension control methods will be evaluated based on dredging and backfill/capping methods, construction sequencing, and ancillary activities within the vicinity of the stream corridor during the design process. In order to minimize resuspension during construction activities, the design will identify best management practices and/or locations where engineering controls (e.g., turbidity curtains) can be implemented during in-stream work, if necessary. Details of the best management practices and/or engineering controls system will be provided in the design documents and will include performance standards, material requirements, and specifications. If more substantial engineering controls are included in the design (e.g., sheet pile), then the HEC-RAS model developed during the PDI will be used to evaluate those engineering controls and associated flow diversion capacities, flow diversion elevations, and required diversion system heights, flood potential, and riverbed scour potential during the remedial construction activities.

5.7.2 Air Monitoring

Intrusive removal activities to be performed at the Subsite have the potential to generate localized impacts to air quality. Construction components that are considered intrusive for the purposes of air monitoring will be determined during the RD. The design will include real-time airborne particulate monitoring during intrusive activities at representative locations at the perimeter of the work area. The ROD specifies that "appropriate controls and monitoring (e.g., community air monitoring) will be utilized to ensure that during remediation activities, airborne particulate and volatile organic vapor concentrations surrounding the excavation area are acceptable" (USEPA 2016). Because volatile organic compounds (VOCs) are not a COC at this site, remediation activities will not result in generation of localized airborne VOCs and controls and monitoring for VOCs are not needed.

The design will consider the following when developing the approach to air monitoring during removal activities and backfill/capping operations:

- Air quality requirements and measurement locations
- Removal and material placement methods
- Potential off-site receptors.

Representative air quality measurements of ambient particulate concentrations prior to initiation of intrusive activities will be collected during baseline air monitoring activities in accordance with the BMP (Appendix A). Details of the best management practices to be implemented during construction to mitigate construction impacts to air quality will be provided in the design documents.

5.7.3 Structural Survey and Geotechnical Monitoring

Structural survey and geotechnical and monitoring requirements (if deemed necessary) will be developed as part of the RD. Based on the outcome of the offset evaluation, use of sloping and/or excavation support, or use of capping instead of removal, the design will include plans and specifications to monitor structures adjacent to removal areas prior to, during, and after intrusive construction activities. If structural survey and geotechnical and monitoring are deemed necessary as part of the RD, then pre-construction structural surveys and baseline geotechnical monitoring will be performed (in accordance with the BMP) to establish baseline conditions of structures (e.g., bridges, roads, buildings) at the Subsite and of vibration in the area of the Subsite.

6 REMEDIAL DESIGN DELIVERABLES

The RD will be completed as a phased process with four stages of design. The Respondents will prepare the following RD reports for USEPA submittal iteratively, with each report including more detail as the RD progresses through each design stage.

- Preliminary (30%) RD Report (Preliminary RD): The Preliminary RD will describe the conceptual framework of the design and include a design criteria report, preliminary drawings, and a list of specifications to be prepared.
- Intermediate (60%) RD Report (Intermediate RD): The Intermediate RD will include reports, plans and specifications at an increased level of detail.
- Pre-Final (95%) RD Report (Pre-Final RD): The Pre-Final RD will include near final reports, plans, and specifications for submittal to USEPA for review and comments.
- Final RD: The Final RD will include finalized plans and specifications suitable for procuring contractors to perform the remedy. The drawings and specifications will be advanced to a level suitable for contractor bidding and ready to be sealed by the Engineer(s) of Record.

Additional details and specific design components to be included in the design deliverables are presented below.

6.1 Preliminary Remedial Design

The Preliminary RD will describe the conceptual framework of the design and include a design criteria report, preliminary drawings, and a list of specifications to be prepared. The design will include a description of how the RA may be implemented in a manner than minimizes environmental impacts in accordance with USEPA Principles for Greener Cleanups (USEPA 2009). Additionally, the Preliminary RD will include:

- Descriptions of substantive permit requirements (i.e., permit equivalency package)
- Preliminary Habitat Restoration Plan
- Preliminary TDP
- Descriptions of monitoring and control measures that will be implemented to protect human health and reduce environmental impacts during the RA (e.g., air monitoring, dust suppression).

6.2 Intermediate Remedial Design

The Intermediate RD will include an increased level of detail from the preliminary submittal and will include the following:

- An updated draft set of construction drawings and initial draft specifications
- A specification for photographic documentation of the remedial action
- Intermediate versions of the elements and deliverables presented in the Preliminary RD, including an Intermediate Habitat Restoration Plan and Intermediate TDP.

The Intermediate RD will also address USEPA's comments on the Preliminary RD, as appropriate.

6.3 Pre-Final Remedial Design

The Pre-Final RD will include near-final level of detail for submittal to USEPA for review and comment, including an increased level of detail from the intermediate submittal. The Pre-Final RD will include:

- A complete set of construction drawings and specifications for implementation of the remedial action, including survey and engineering drawings showing existing OU features (e.g., property boundaries, easements)
- An updated (as appropriate) specification for photographic documentation of the remedial action
- Pre-final versions of the elements and deliverables presented in the Preliminary RD and Intermediate Design, including a Pre-Final Habitat Restoration Plan and Pre-Final TDP
- Initial draft versions of the SMP, ICIAP, and PRSP.

The Pre-Final RD will also address USEPA's comments on the Intermediate RD, as appropriate.

6.4 Final Remedial Design

The Final RD will include finalized plans and specifications suitable for procuring contractors to perform the remedy. The final construction drawings and specifications will be advanced to a level suitable for contractor bidding and be sealed by a registered Professional Engineer in New York State. The Final RD will include:

- Final versions of the TDP and Habitat Restoration Plan
- Revised draft versions of the SMP, ICIAP, and PRSP.

The Final RD will also address USEPA's comments on the Pre-Final RD, as appropriate.

7 REMEDIAL DESIGN PROJECT SCHEDULE

As described in the SOW, the Preliminary RD is scheduled to be submitted to USEPA within 90 days after USEPA approval of this RDWP. The schedule for the Preliminary RD and subsequent RD deliverables is summarized below.

- Preliminary RD – Scheduled to be submitted 90 days after USEPA approval of the RDWP
- Intermediate RD – Scheduled to be submitted 60 days after USEPA comments on the Preliminary RD
- Pre-Final RD – Scheduled to be submitted 60 days after USEPA comments on the Intermediate RD
- Final RD – Scheduled to be submitted 60 days after USEPA comments on the Pre-Final RD.

USEPA's July 28, 2020 comments on the May 2020 PDI Data Summary Report requested the Local Disposal Agreement be included as part of (or submitted concurrently with) the Preliminary RD. However, due in part to the lengthy review and approval periods required of local municipalities, it is anticipated more than 90 days will be required to secure the executed Local Disposal Agreement(s) with the owner(s) and/or operator(s) of the chosen disposal facility(ies). The Respondents will initiate the agreement process upon USEPA concurrence with the Local Disposal Assessment, and the RD will continue while negotiations and reviews by local municipalities progresses. An update on the status of the agreement process will be included in the Preliminary RD, and it is anticipated the executed Local Disposal Agreement will be provided to USEPA at the Intermediate RD stage in the design process.

Note that, based on the progress of the ongoing remediation of Upper Ley Creek, certain portions of the RD activities described herein may be delayed. Specifically, as discussed in Section 4.1, based on the potential for changes in surface sediment conditions due to overtopping or releases to the Subsite over the duration of Upper Ley Creek construction, additional pre-removal sampling of surficial sediment and/or additional survey activities may be warranted. If additional sampling or other investigations are deemed appropriate, then the Respondents will work with USEPA to sequence timing of such work. Regardless, the implementation of remedial construction activities in Lower Ley Creek will not be initiated until remedial construction activities are complete in Upper Ley Creek.

Periodic meetings will be scheduled to discuss the status of ongoing efforts, upcoming events, and deliverables to resolve any issues that may arise during development of the RD. The contractor procurement process for implementation of the remedial action will not likely occur until after USEPA approval of the Final RD; however, the approach for contracting, construction, and operation and maintenance of the remedial action will be further developed in the forthcoming RD deliverables and is subject to change based on the PRP Group participants at the time of implementation.

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